

IMPORT/EXPORT CONFIGURATION GULF OF CALIFORNIA OR PACIFIC OCEAN

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PURPOSE OF CONFIGURATION

The purpose of this configuration is to provide a whole Sea configuration that maintains a stable marine Sea at a constant elevation and salinity that is similar to what is there today. This configuration relies on importing water from the Gulf of California or the Pacific Ocean to make up the eventual loss of Sea inflows, and exchanging Sea water with the Gulf or Ocean to maintain a marine salinity in the Sea. This configuration would maintain a Sea elevation close to what is there today. There are no new created habitats proposed since conditions will be similar to existing. Similarly, management of exposed playa areas will be minimal; however, some actions to reduce emissive playas would be part of this configuration if the Sea elevation is below the existing elevation.

DESCRIPTION OF CONFIGURATION AND FACILITIES NEEDED

The Import/Export Configuration includes the following major features:

- ❖ **Marine Sea:** The Marine Sea in this configuration would resemble the existing Salton Sea. Elevation would be maintained at the existing elevation or slightly lower (-230 to -235 feet mean sea level [msl]). Salinity and water elevation under this configuration are controlled primarily by ocean salinities, water exchange rates, and changes in Salton Sea inflows. A minimum target salinity of 44,000 milligrams per liter (mg/L) may be all that is possible. This salinity is similar to existing conditions. No additional habitat creation or restoration is proposed within the Sea.

To maintain the salinity of the Marine Sea at 44,000 mg/L, Gulf or Ocean water must be imported to the Sea, and Sea water must be exported to the Gulf or Ocean. This is needed because Ocean water contains a much higher salt load, and therefore, would substantially increase the salt loading to the Sea. Export of Sea water reduces this excess salt load. Over 3.36 million acre-feet per year would be imported and over 2.73 million acre-feet per year would be exported to maintain the target salinity and elevation at the Sea given expected Salton Sea inflows of 650,000 acre-feet per year.

- ❖ **Import/Export Pipelines and/or Canals:** This configuration would include the construction of multiple pipelines and/or canals and pump stations to convey water from the Salton Sea to the Pacific Ocean or Gulf of California. Similarly, a system to convey Gulf or Ocean water to the Salton Sea would also be necessary. The route to the Pacific Coast would involve significant lift over the Santa Rosa Mountains, or will require extensive tunneling through the mountain range (over 4,500 feet elevation difference). The route to the Gulf of California would require between 400 to over 1,500 feet of lift, depending on the route selected and the conveyance system chosen. Both options would require a substantial amount of electricity to pump the water; however, some power recovery is possible.

Both import and export facilities are needed for the amount of water being exchanged. These facilities are likely to require different alignments due to grade differences and flow directions. Local and regional geology will dictate final alignments. Intake structures would be needed in both the Sea and the Ocean/Gulf. To reduce environmental impacts, all intakes will have to be screened and export flows will have to be primary filtered to protect the Ocean or Gulf. Outlet facilities will also require extensive diffusers to distribute the Salton Sea export flows similar to that used in treated sewage ocean outfalls. Intake and outlet facilities will need to be located in different areas to ensure adequate mixing and to avoid recirculating salts and nutrients.

- ❖ **Water Quality Management:** Primary water treatment (i.e., filters) are anticipated to be required on the Salton Sea export flows. Additional water treatment may be needed if these processes are not sufficient to reduce impacts.

HOW THE CONFIGURATION WORKS

- ❖ Water from the New, Alamo, and Whitewater Rivers and other minor tributaries would flow into the Salton Sea as they currently do.
- ❖ Salton Sea water would be pumped to the Gulf or the Pacific Ocean. An intake structure would be constructed on the west side of the Sea, and water would be exported from the Sea to either the Gulf or the Pacific Ocean. Under the Gulf of California scenario, a screened and filtered intake, pipeline/canal, and pumping plants would be constructed to export water from the Sea to the Gulf of California. An outlet structure and diffuser would be constructed on the west side of the Gulf. Under the Pacific Ocean scenario, a screened and filtered intake, pipeline/canal, and pumping plants would be constructed to export water from the Sea to the Pacific Ocean. A deep ocean outlet with extensive diffuser would be constructed to distribute flows.
- ❖ Gulf or Ocean water would be imported to the Sea via a screened intake to protect Ocean or Gulf aquatic species from entrainment. A Salton Sea outlet structure would be constructed on the east (Gulf scenario) or west (Pacific Ocean scenario) side of the Sea to ensure adequate mixing. Intakes at the Gulf or Ocean would be

Main Characteristics After 75 Years:

Based on inflows of 650,000 acre-feet and elevation target of -235 feet msl

Marine Sea:

- ❖ Salinity: 44,000 mg/L
- ❖ Surface area: 218,000 acres

Import/Export Pipelines and/or Canals: *Gulf of California:*

- ❖ Import:
 - Pumping Plants: 4 @ 4,700 cfs each
 - Pipelines: 8 @ 12.5-foot diameter, each about 74 miles long
 - Canals: 104 miles, concrete lined
- ❖ Export Facilities
 - Pumping Plants: 5 @ 3,800 cfs each
 - Pipelines: 6, 12.5-foot diameter, each about 74 miles long
 - Canals: 104 miles, concrete lined

Air Quality Management:

- ❖ No exposed playa below -235. air quality management above this level may require mitigation

Estimated Capital Cost:

Gulf of California: \$49 billion

Pacific Ocean: Not available at this time.

separated a sufficient distance from the Sea outfalls to reduce salt recirculation back to the Sea. A second series of pipelines, canals, and pumping plants would be needed to import water to the Sea. There are no proposed diffuser facilities constructed at the Sea.

- ❖ Inlet and outlet facilities at the Sea would be designed to improve circulation in the Sea.

WHAT HAPPENS IF AVERAGE ANNUAL INFLOWS ARE GREATER THAN 650,000 ACRE-FEET?

If average annual inflows are greater than 650,000 acre-feet, then less water would need to be imported and exported to maintain the target salinity and elevation in the Sea. Higher inflows come into the Salton Sea at substantially lower salinities than what must be imported from the Ocean and Gulf. The water demand to maintain the sea elevation due to evaporation is over 1 million acre feet per year, regardless of the inflow supply.

CAN THE NUMBER OR COMPLEXITY OF FACILITIES BE REDUCED?

This configuration could be simplified by changing the target salinity and/or elevation in the Sea. For example, a higher target salinity or lower Sea target elevation would reduce the amount of water to be imported/exported and reduce the amount of facilities required. The salinity target could be achieved with export of Sea water only, but the elevation target could not be achieved. Conversely, the elevation target could be achieved with import of water only, but the salinity target could not be achieved and the Sea would become hypersaline quickly.

ARE THERE OTHER CONSIDERATIONS THAT WOULD NEED TO BE ADDRESSED FOR THIS CONFIGURATION?

There are various considerations that would need to be addressed for this configuration that are above and beyond the considerations for the other configurations. These are:

- ❖ International Project: For the Gulf of California Import/Export Configuration, over half of the facilities would be constructed in the Republic of Mexico. Coordination and approval from Mexico would be required for construction and operations and maintenance of facilities. Additionally, there is uncertainty over whether or not the State of California can own and operate facilities in another country. Under U.S. Federal law and regulations, any formal discussions with the Republic of Mexico need to be coordinated through the U.S. Department of State, and the U.S. Federal government would be a critical partner to implementing this configuration.
- ❖ Species Exchange: For both the Gulf of California and the Pacific Ocean Import/Export Configurations, the exchange of water between two ecosystems (the Sea and the Gulf or Ocean) may facilitate the exchange of non-desirable plants and animals between these ecosystems, and the introduction of invasive and exotic species.

- ❖ Environmental and Biological Impacts: Both configurations would need to comply with existing environmental regulations including the California Ocean Plan or similar criteria. Project activities in Mexico would also need to comply with California and U.S. Federal environmental laws and regulations, and environmental laws and regulations in Mexico. In addition, the Colorado River Delta and the upper Gulf of California have been designated as a biosphere reserve by the Republic of Mexico and is recognized by the United Nations Educational, Scientific and Cultural Organization's Man and Biosphere program.

